STUDY ON THE COLOSTRUM MILK OF THE EGYPTIAN BUFFALOES

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INTRODUCTION

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The milk obtained in the first days after parturition; the colostrum, is markedly different from normal milk in every aspect. The colostrum is so vital to the calf's well being that calves fed colostrum have more chance to survived than those deprived of colostrum and fed milk directly. The importance of colostrum lies in the fact that it contains a high percentage of immune globulin which provides the new born calves with immunity towards many diseases. The large demand on milk in addition to its high price encourages many producers to deliver milk to the collecting centers soon after calving. Consequently, many technical problems arises from the inclusion of colostrum in normal milk. Therefore, some restriction must be put to the period after which milk can be accepted for human consumption.

The composition of colostrum and the rate of its changes to normal milk is largely dependent on the kind and individuality of the animal. Most of the data presented in the literature is mainly concerned with cow's milk and little have been done on the colostrum of other mammals especially buffaloes.

Therefore, the present study was initiated to fill this gap. The results presented and discussed in these parts were as follows :

Part I : Properties and composition of colostrum of Egyptian buffaloes.

Part II : Interrelationships between the constituents of buffalo colostrum during two weeks after parturition.

Part III : The interrelationships between the chemical composition and heat stability, rennet, and ethanol coagulation of buffalo colostrum during two weeks after parturition.

REVIEW OF LITERATURE

Mukharjee, et al, (32), in 1944, stated that pre-milk colostrum was yellow in colour, viscous, high in T.S., acidity and proteins especially globulin. He also found that its lactose content was too low to estimate, but gradually increased to its level in normal milk.

Parrish, et al, (35), in 1950, analysed the colostrum of cow's for the different milk constituents as well as its specific gravity. They found that the concentration of the different constituents varied widely in the first milking, as shown in the following :

	Minimum	Maximum	
Total solids	9.0	33.9	per cent
Fat	0.3	18.0	per cent
Total protein	4.0	24.6	per cent
Lactose	0.4	4.1	per cent
Ash	0.81	1.47	per cent

Furthermore, total solids, solids-not-fat, total protein and ash contents decreased rapidly during the first 4 to 6 milkings, and slowly thereafter. The lactose content, however, varied inversely with the total solids.

McIntyre, et al, (28), in 1952, showed that the pH value increased gradually from an average of 6.32 in first colostrum to 6.50 in milk of the 14th day.

Patel and Patel, (36), in 1955, stated that the first milking yielded an average of 10.4 lb colostrum with 3.2 per cent butterfat. They found that the second and eighth milkings yielded an average of 5.7 and 8.1 lb colostrum, with 5.3 and 5.5 per cent butterfat respectively.

Dasture and Rao, (12), in 1956, reported that the colostrum had a lower pH and a higher buffer value than normal milk. They found that the pH values for colostrum varied from 6.40 to 6.49 in buffaloes and from 5.37 to 6.48 in cows. The peak buffer values for buffaloes and cow's colostrum were 0.0782 and 0.0700 respectively.

El-Negoumy, (14), in 1957, studied the properties and composition of colostrum from local buffaloes and cows. He found that buffaloe's colostrum had a higher total solids, lactose, total nitrogen, globulin nitrogen and proteose-peptone nitrogen contents than cow's colostrum. The average values of the preceding constituents were found to be 26.99, 3.39, 2.721, 1.497,

and 0.231 per cent respectively in buffaloe's colostrum, and 22.67, 1.59, 2.181, 1.198, and 0.044 per cent in cow's colostrum. He noticed that during the transition period from colostrum to milk the acidity and chloride contents decreased and the pH increased until the normal levels were reached at the 15th of milking. On the other hand, the level of total solids and the total nitrogen dropped by the 3rd milking, while there was no appreciable changes in the lactose content. Finally he concluded that the composition of milk became normal after 5 days of parturition.

Makhnyuk, (26), in 1958, found that the length of the dry period affected the composition of cow's colostrum during 10 days postpartum. He showed that the acidity, butterfat, protein, and minerals; Ca and P contents increased with the length of the dry period. He concluded that a short dry period of 45 days had no adverse effect on the composition of colostrum.

Patel and Patel, (37), in 1958, reported that the colostral milk of Kankrej cows at the 1st milking contained an average of 23.73 per cent total solids, 3.46 per cent fat, 14.12 per cent protein, 4.2 per cent

casein, and 7.24 per cent globulin. By the 8th day the casein content was the only constituent which was still a little higher than that of the milk.

They, (38), in 1959, showed that during the 8 days following parturition, from the 1st to 16th milkings, the chloride content decreased from 0.25 to 0.12 per cent; the ash content from 0.91 to 0.74 per cent and Ca content from 0.25 to 0.22 per cent, while the lactose content increased from 3.09 to 4.86 per cent, and only Ca reached its level in normal milk by 8th day.

Prophulla and Anaatakrishnan, (40), in the same year, reported that after 4 days of parturition colostrum was richer than normal milk in Na, K and Cl contents but poorer in lactose.

Miyabe, et al, (30), in 1962, studied the chemical composition of alcohol positive colostrum and milk. They observed large variations in the fat, protein, lactose and ash contents of alcohol positive colostrum. They suggested that the protein distribution in both abnormal colostrum and milk were different.

Salerno and Tiberio, (43), in 1963, investigated the protein distribution in the colostrum of Italian buffaloes. They found that after 4 hr. of parturition the colostral milk contained 11.46 per cent total protein, 6.82 per cent casein, 3.28 per cent whey protein, and 1.36 per cent non-protein nitrogen. However, in the 12th milking, they showed that these protein fractions decreased reaching 5.40, 4.90, 0.44 and 0.06 per cent respectively. Electrophoretic analyses of whey protein showed an increase in B-lactoglobulin from 15.8 to 55.0 per cent and in a-lactalbumin from 4.0 to 19.3 per cent but a decrease in immunoglobulins from 74 to 24 per cent while the serum albumin values remained low.

Mazziotti, (27), in the same year, found that the fat, protein, total solids, and lactose contents of buffaloe's colostrum decreased from 9.55, 9.59, 26.63 and 7.54 per cent on the 1st day to 7.61, 5.55, 18.87 and 4.41 per cent respectively on the 7th day after parturition. He observed that the protein and total solids contents decreased rapidly from the 1st to the 2nd day of parturition.

Ghosh and Anantakrishnan, (17), in 1964, carried a detailed study of the changes in major and minor